



How We Learn: Developing Expertise at NASA

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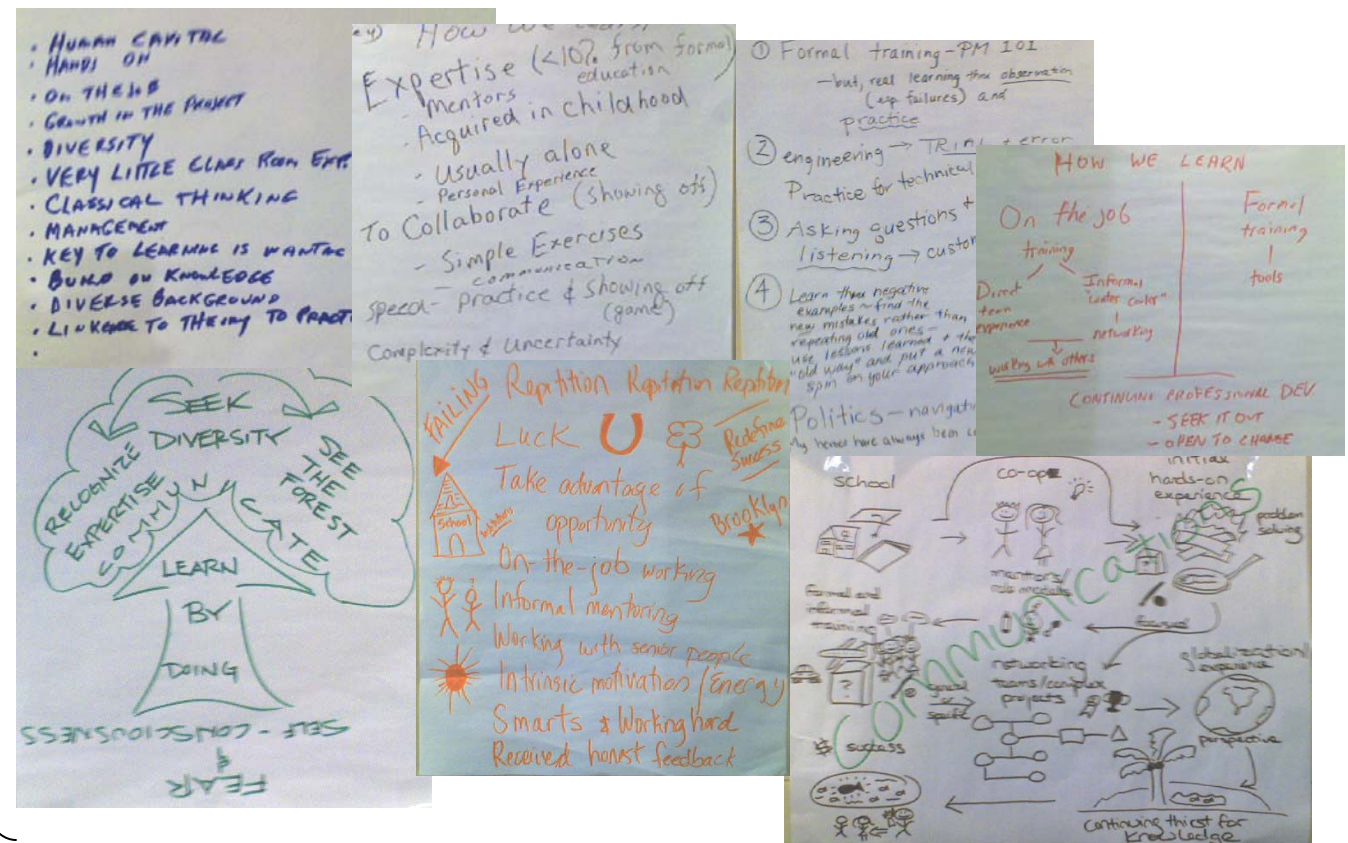


Data Gathering



Masters Forum 14 - April 2007

We divided 70 NASA master practitioners into small groups and asked them to answer one question: how do you learn how to do your job?





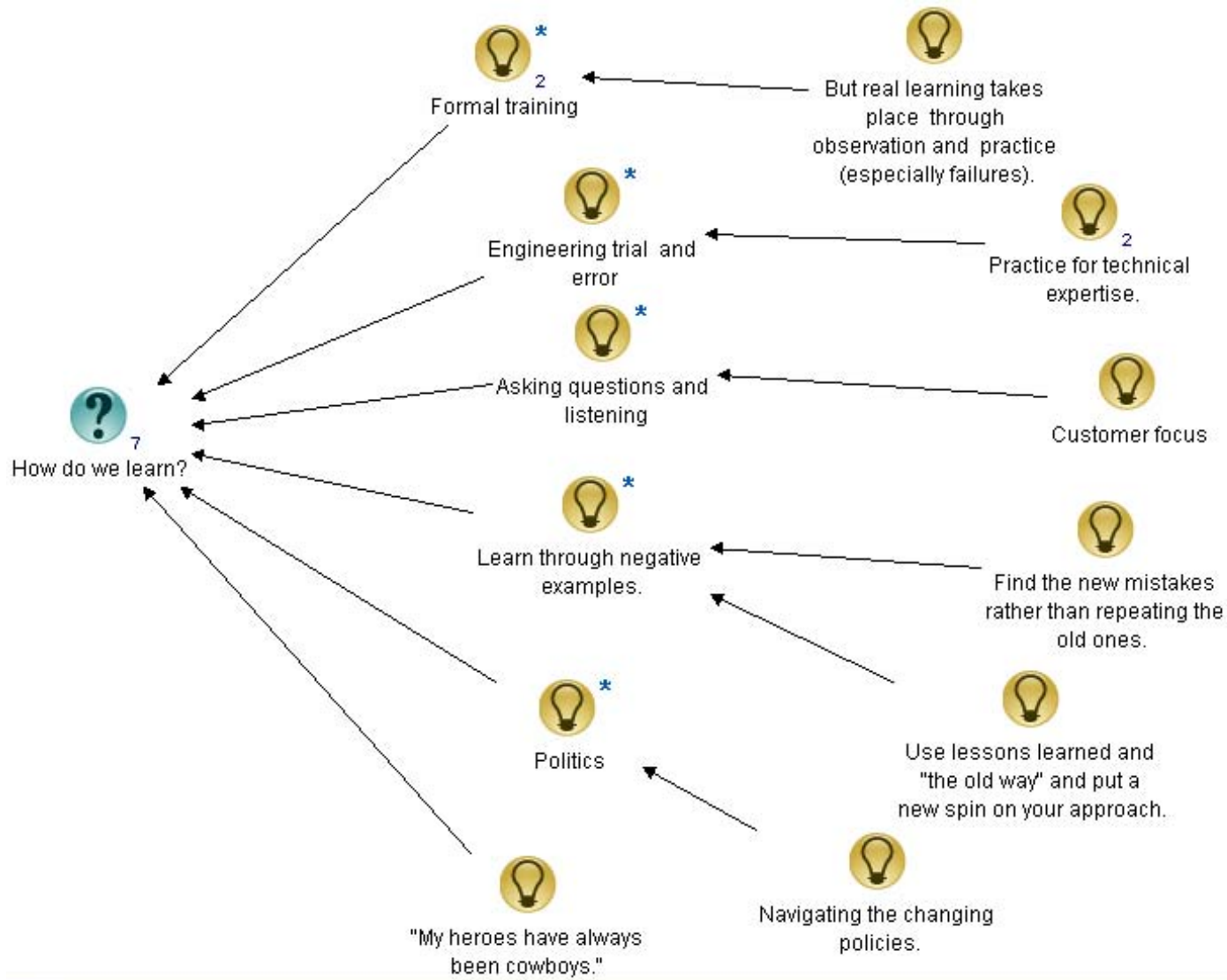
How Do We Learn? #1



- ① Formal training - PM 101
- but, real learning thru observation
(esp failures) and
practice
- ② engineering → TRIAL + error
Practice for technical expertise
- ③ Asking questions +
listening → customer focus
- ④ Learn thru negative
examples ~ find the
new mistakes rather than
repeating old ones -
use lessons learned + the
"old way" and put a new
spin on your approach
- ⑤ Politics - navigating thru ^{Δing} politics
- ⑥ "My hennet have always been convboys"

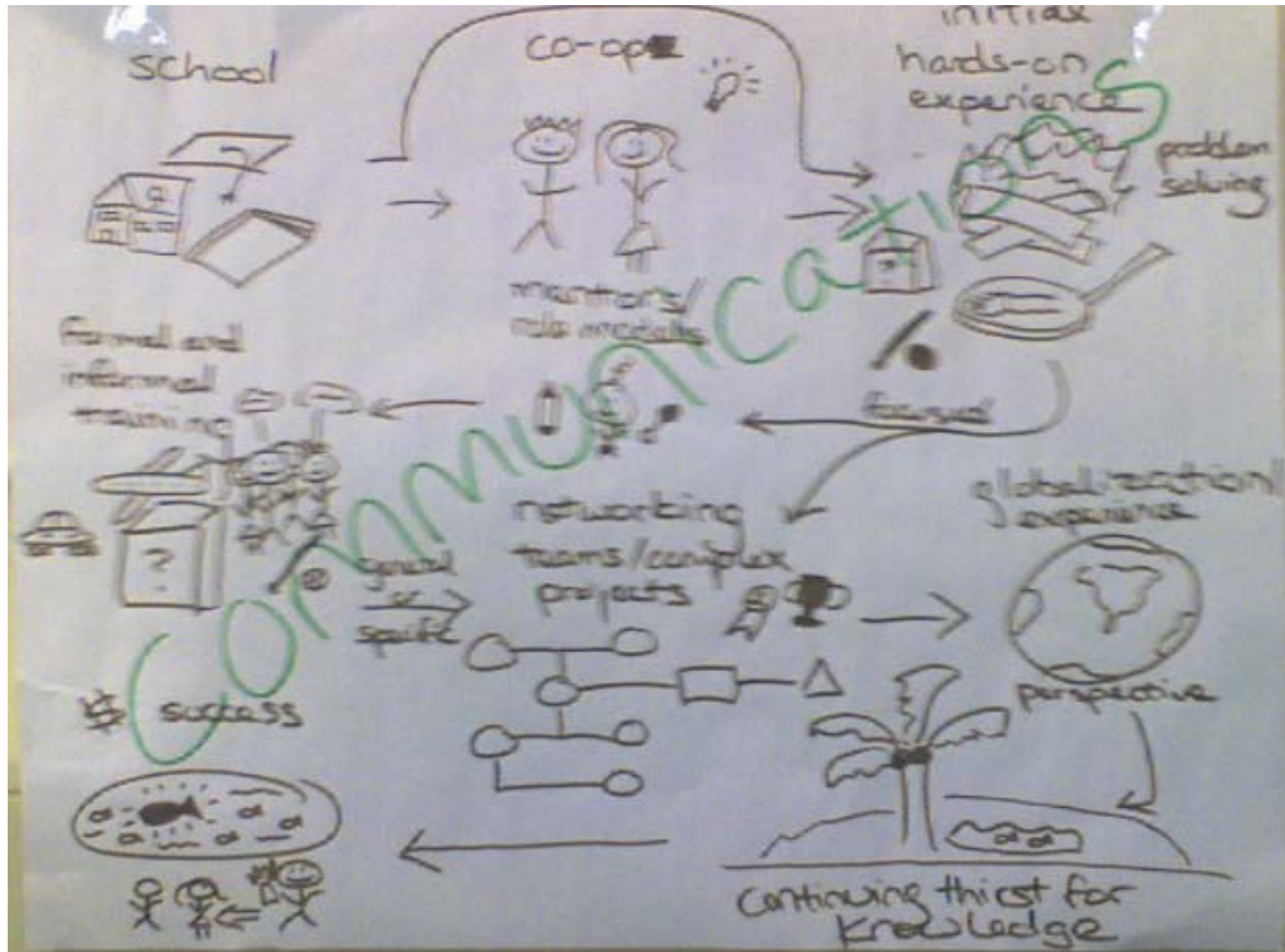


How Do We Learn? #1 (mind map)



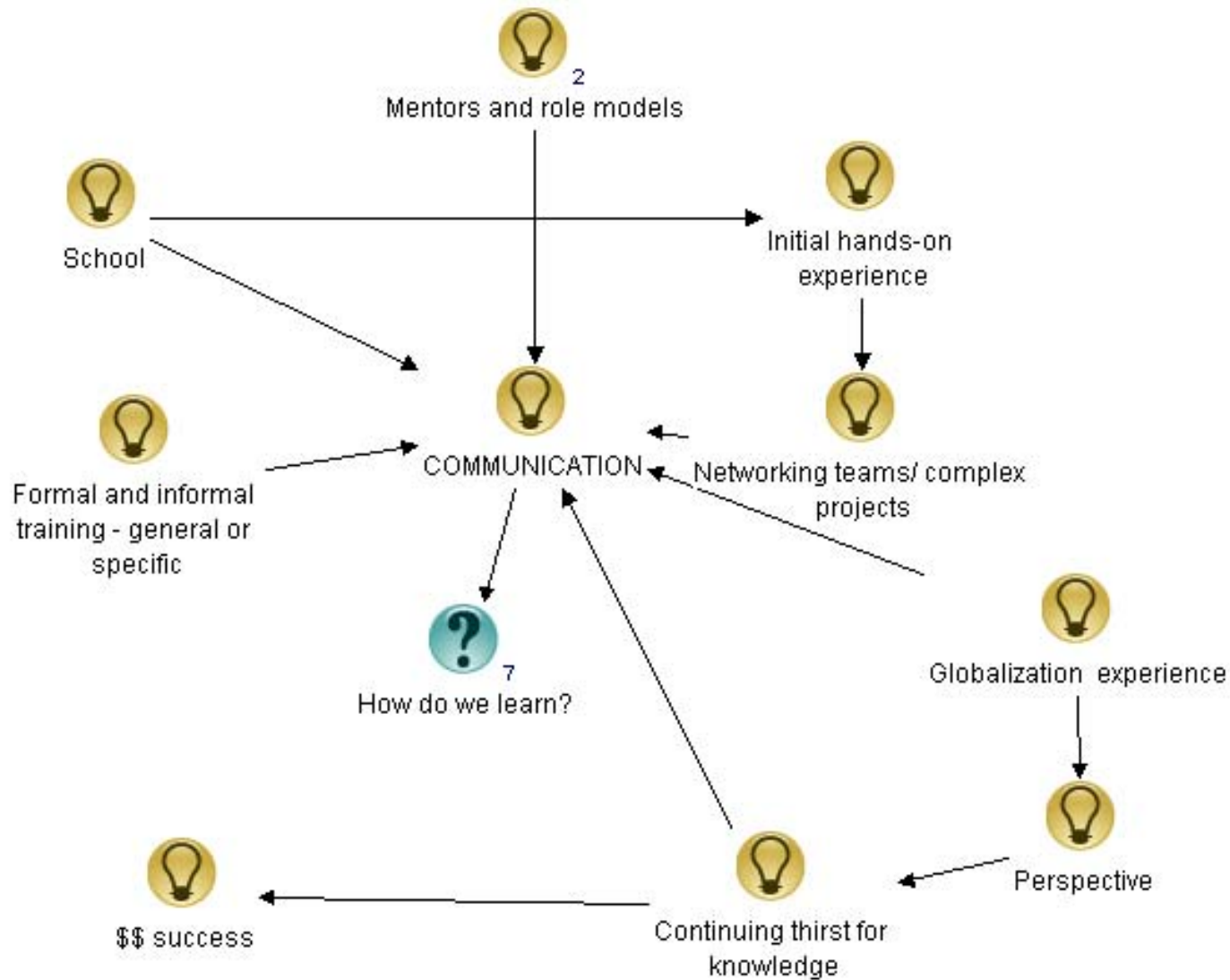


How Do We Learn? #2



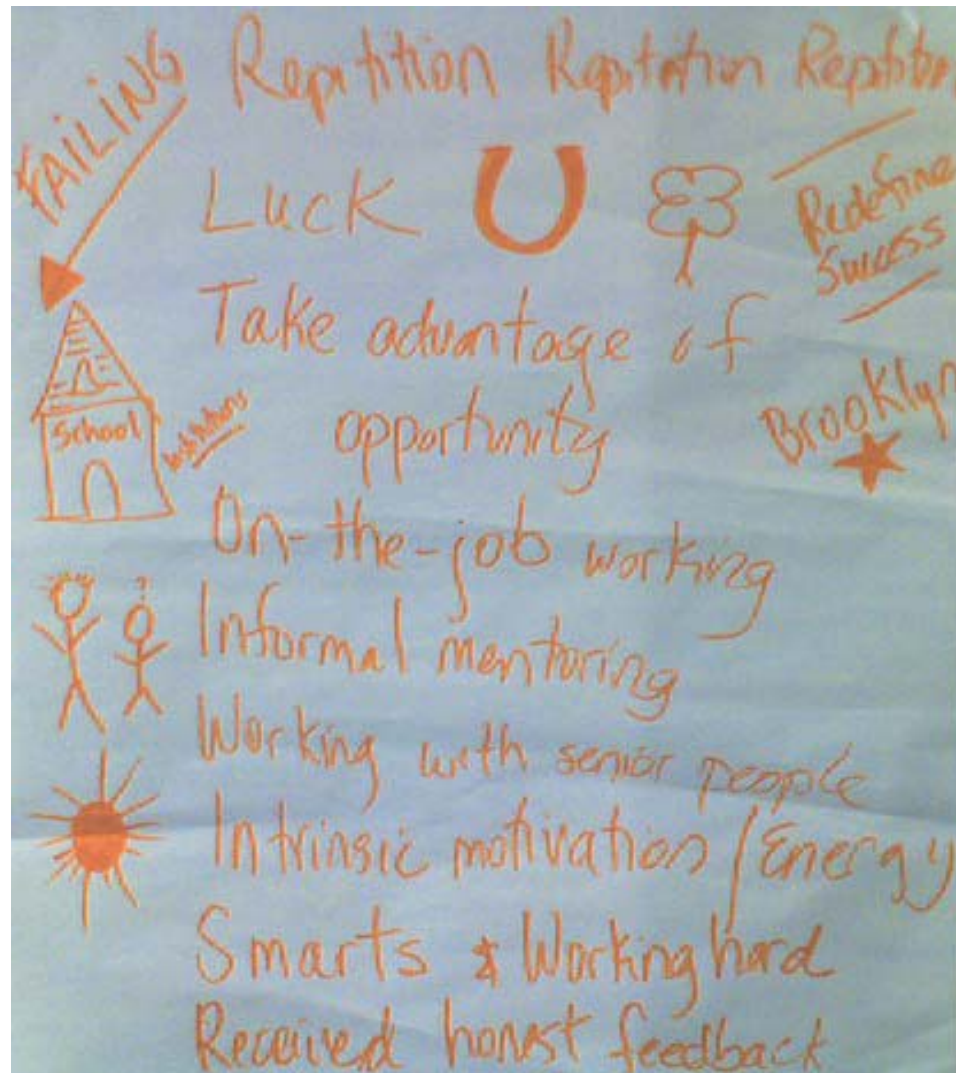


How Do We Learn? #2 (mind map)





How Do We Learn? #3





How Do We Learn? #3 (mind map)





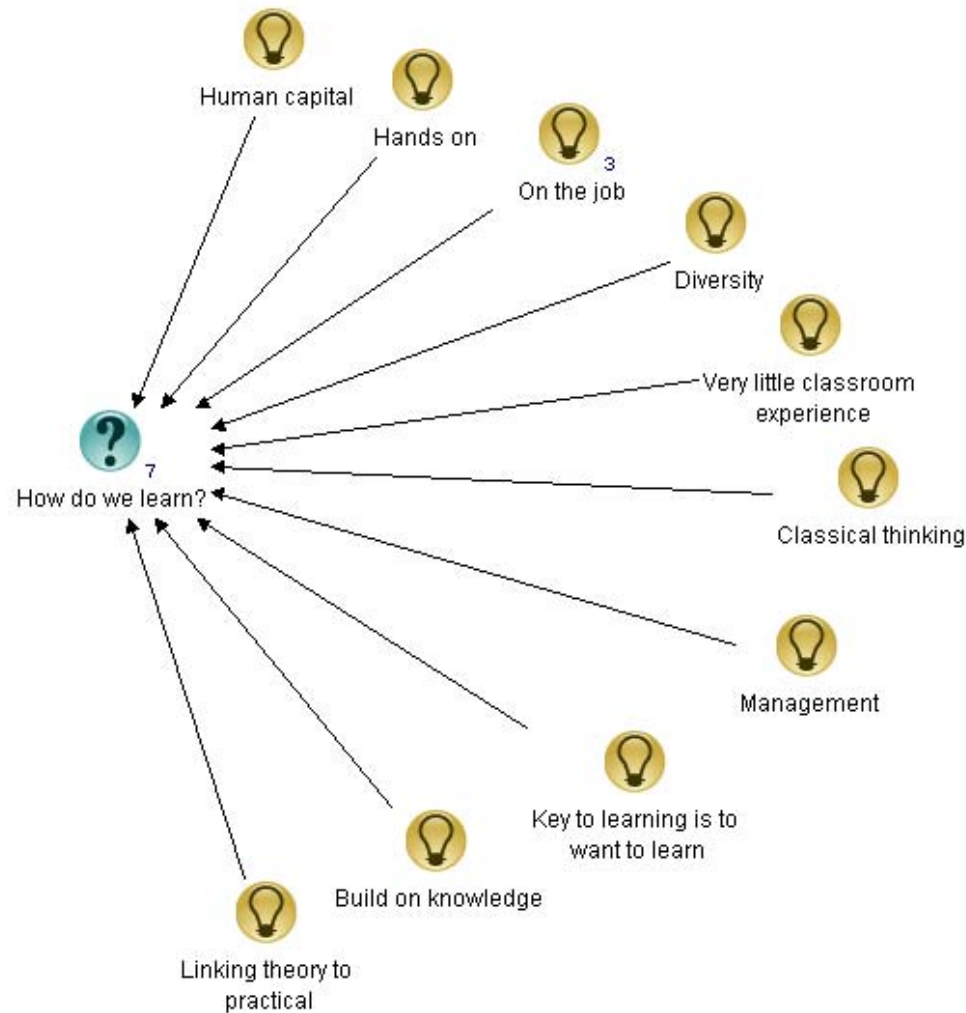
How Do We Learn? #4



- HUMAN CAPITAL
- HANDS ON
- ON THE JOB
- GROWTH IN THE PROJECT
- DIVERSITY
- VERY LITTLE CLASS ROOM EXP.
- CLASSICAL THINKING
- MANAGEMENT
- KEY TO LEARNING IS WANTING TO LEARN
- BUILD ON KNOWLEDGE
- DIVERSE BACKGROUND
- LINKAGE TO THEORY TO PRACTICAL
-



How Do We Learn #4 (mind map)





How Do We Learn? ?#5



24) How we learn

Expertise (<10% from formal education)

- Mentors
- Acquired in childhood
- Usually alone
- Personal Experience

To Collaborate (showing off)

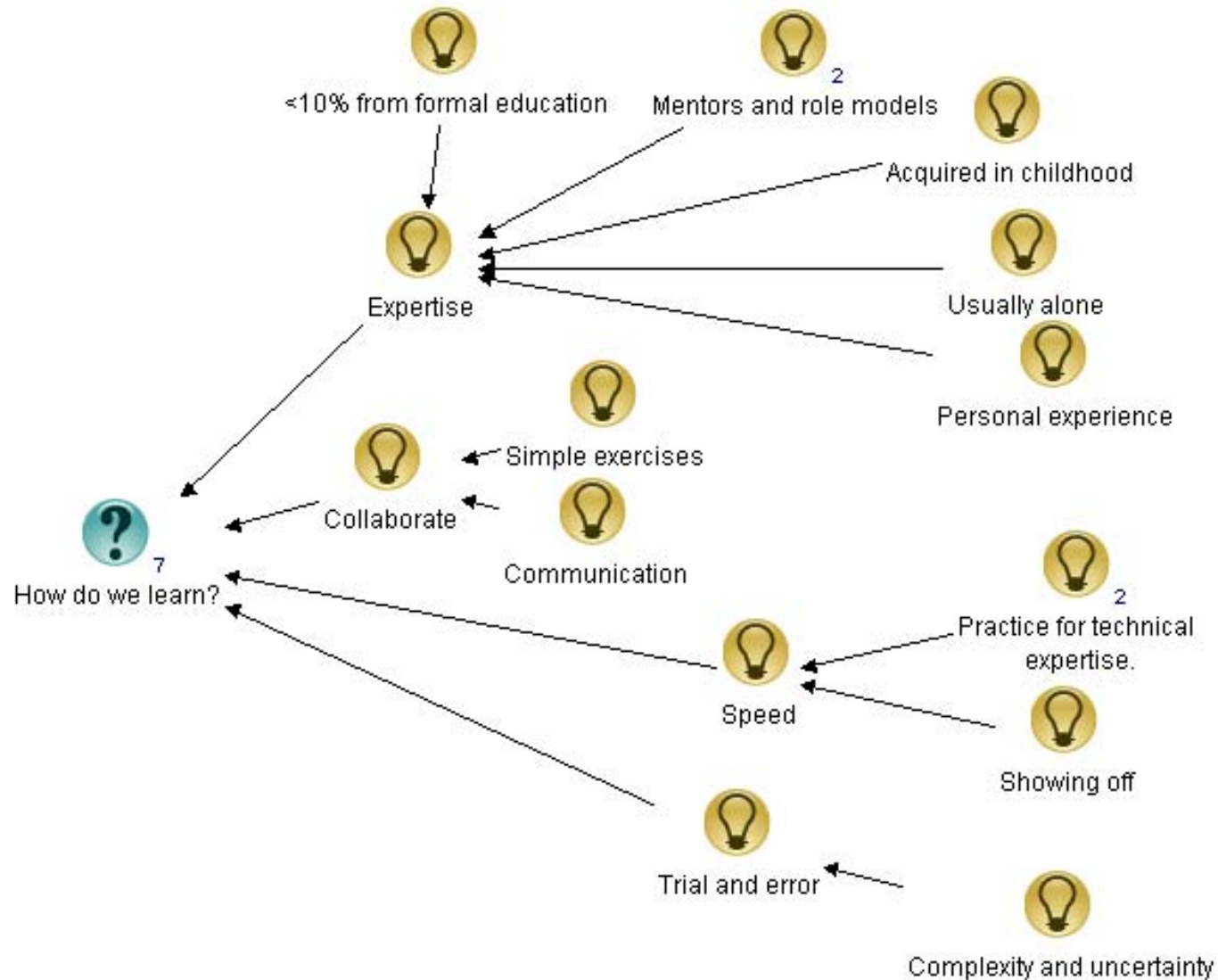
- Simple Exercises
- ^{communication} Speed - Practice & Showing off (game)

Complexity & Uncertainty

- Trial & Error

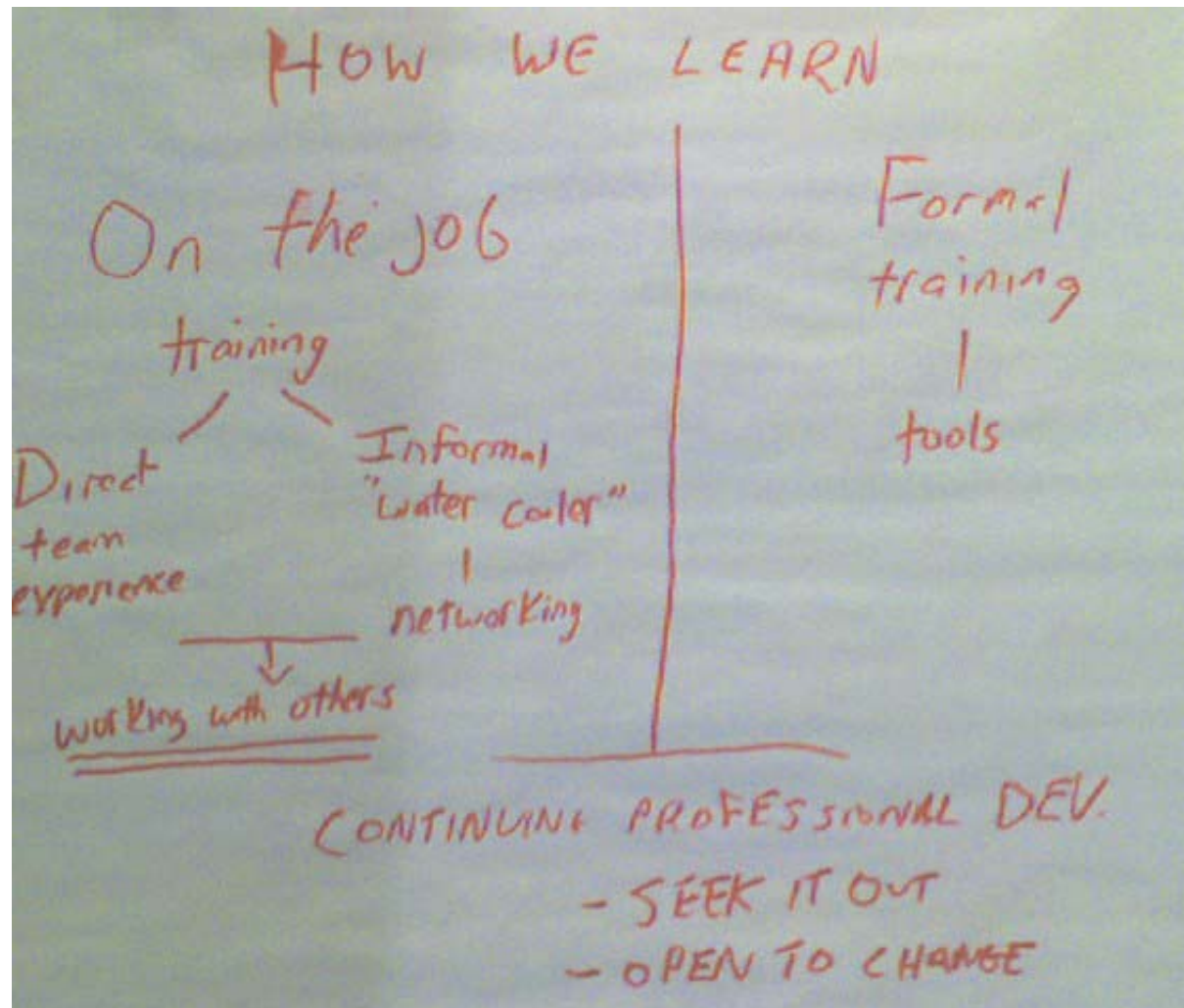


How Do We Learn #5 (mind map)



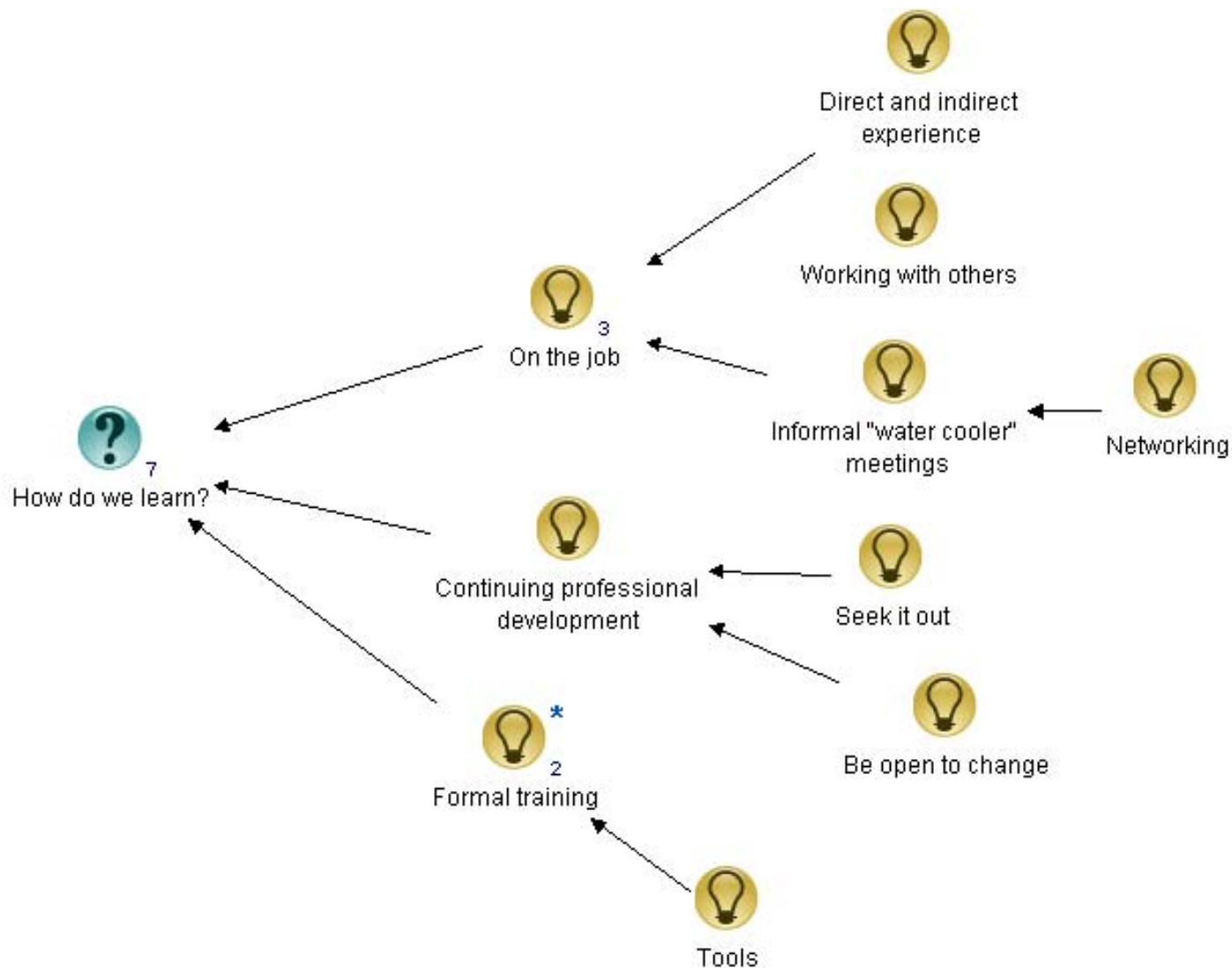


How Do We Learn? #6





How Do We Learn? #6 (mind map)



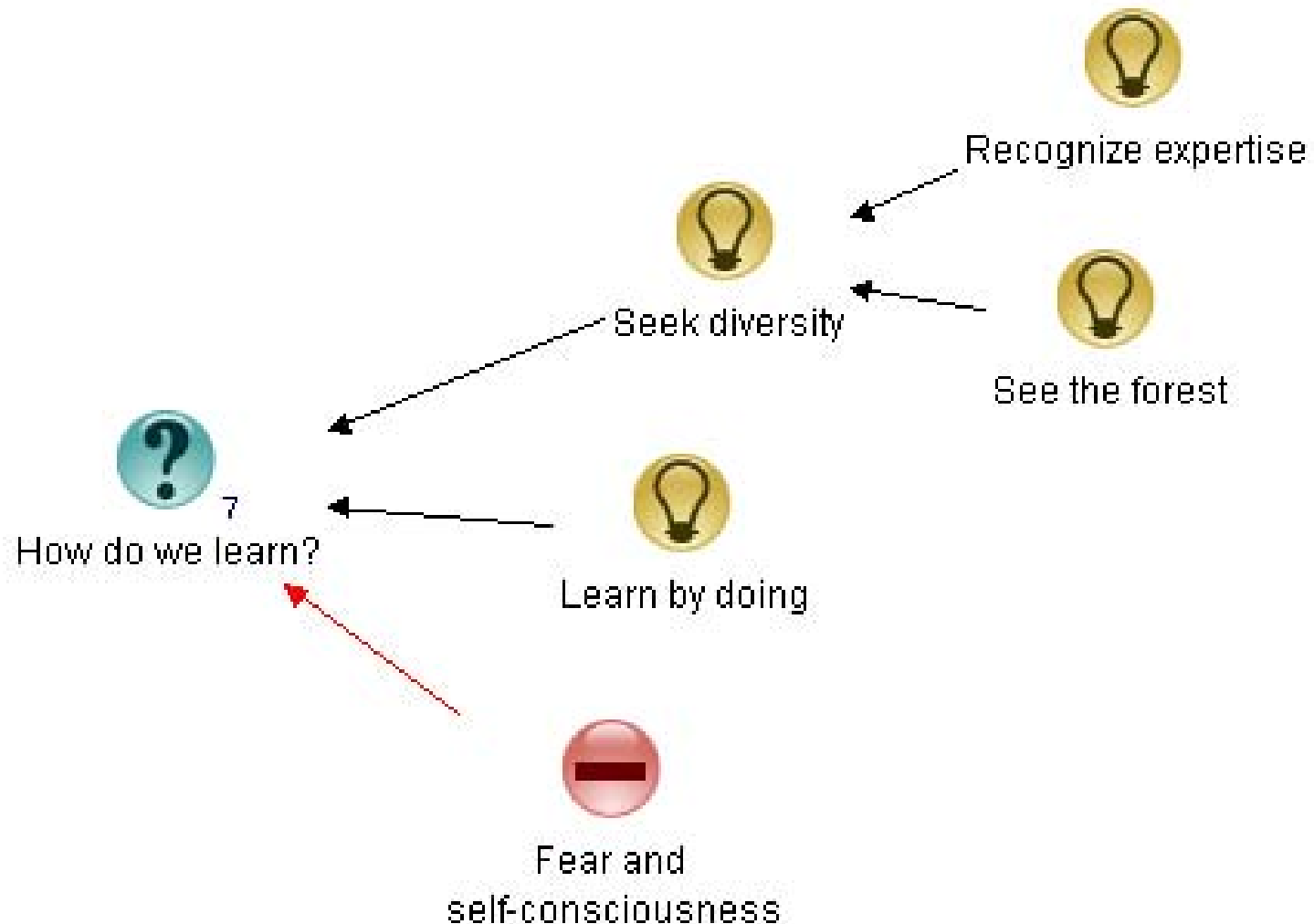


How Do We Learn? #7



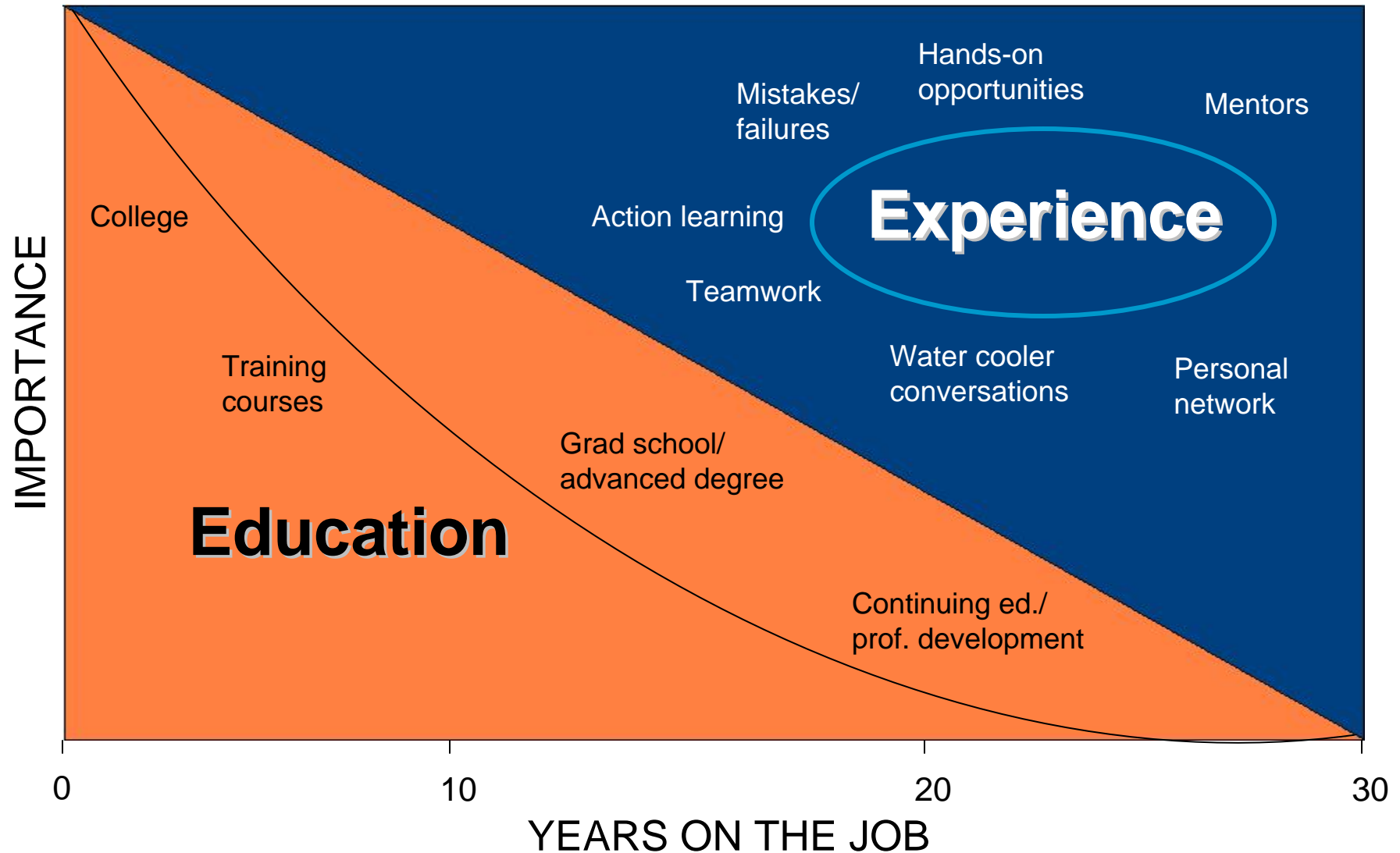


How Do We Learn? #7 (mind map)





Learning Continuum





Request for Data



- How do you learn?
- How does your project team learn?